NORMAL STOCK MARKET LIFE IS LIKE BEING ON HOLIDAY: PRE-HOLIDAY EFFECT; EMPIRICAL EVIDENCE FROM SENSEX AND NIFTY 50 INDICES ON HOLIDAY EFFECT IN INDIAN STOCK MARKETS

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ABSTRACT

The study investigated the holiday effect in the benchmark indices of Indian stock markets. For the purpose of analysis, the data has been collected from the official website of BSE and NSE for the period of 1st April 2006 to 31st March 2016, which is consisting of ten years. The data has been analyzed and empirically tested by different statistical tools namely; Unit Root Test, Descriptive statistics, Ordinary Least Square Regression, GARCH model and so on. The descriptive statistics revealed that pre-holiday trading days give a maximum mean return and the empirical analysis of the GARCH model exposed that, the coefficient value of Pre-Holiday highly significant at 1 per cent in SENSEX and NIFTY 50 indices. Consequently, Pre-Holiday trading day yields the highly significant abnormal return rather than normal trading days. The study advised the investors to follow the pre-holiday effect and earn an abnormal return from the investment.

Keywords: Pre-Holiday, Post-Holiday, Calendar anomalies, ARIMA, GARCH (1,1)

INTRODUCTION

The study of calendar anomalies in the stock market is very quiet and interesting for the researcher and the investors. In order to study the holiday effect in Indian stock markets, the researcher chose the benchmark indices of Indian Stock Market namely SENSEX AND NIFTY 50. SENSEX is the bench market index of Bombay Stock Exchange, it is consists of 30 stocks companies which is large and financial sounded companies. Similarly, NIFTY 50 is benchmark index of National Stock Exchange of India. It comprises of 50 stocks companies and covers the 22 sectors of Indian economy. The Pre-Holiday effect is a calendar anomaly in equities. It is the tendency for a stock market to gain on the final trading day before a holiday. Research shows that market return during pre-holiday days is often more than 10 times larger than the average return during normal trading days. It seems that a substantial part of the equity premium is concentrated in these several days. This anomaly has been documented in many countries so its validity seems really strong. Pre-holiday days on the market are often characterized by lower liquidity as a lot of market participants are not involved in the market or they lower their exposure. Higher probability of positive market movement is consequently only a natural tendency as people are psychologically more optimistic. Therefore very simple strategy could be constructed to exploit this market inefficiency (quantpedia.com). The efficient market hypothesis (EMH) states that all stocks are properly priced and that abnormal returns cannot be earned by searching for mispriced stocks. Furthermore,

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because future stock prices follow a random walk pattern, they cannot be predicted. However, there does seem to be some market patterns that can lead to abnormal returns, thus violating the efficient market hypothesis, particularly the semi-strong EMH, which predicates that abnormal returns cannot be earned by learning all of the available public information on companies and their stocks, and any other variables that may affect stock prices, such as economic factors. Hence, the semi-strong EMH would seem to negate the value of fundamental analysis. Market anomalies are market patterns that do seem to lead to abnormal returns more often than not, and since some of these patterns are based on information in financial reports, market anomalies present a challenge to the semi-strong form of the EMH, indicating that fundamental analysis does have some value for the individual investor (thismatter.com) .

OBJECTIVES OF THE STUDY

The overall objective of the study is to examine the Holiday effect in SENSEX and NIFTY 50 indices of Indian stock markets. The following are specific objectives they are

1. to identify the descriptive statistics SENSEX and NIFTY 50 indices for Holiday wise; and

2. to examine whether return series is stationary or not.

HYPOTHESES

1. There is no stationarity in the return series of SENSEX and NIFTY 50 indices.

2. The average returns of pre-holiday, post-holiday and weekdays are identical.

REVIEW OF LITERATURE

Francis Gnanasekar I and Rajesh E (2014), the study highlighted the share markets, ups and downs of prices election effect and after exit polls. Numerous academicians and researchers have earlier stated that exit polls indeed are driving factor of the economic status, especially for the share market.

Vadali Sriram Datta *et al.,* (2014), the study examined the impact of the holiday in Stock Market Returns. The findings of the study shown that Trading holidays are also having a significant role in decision making for the investor with this analysis it has been observed that there is a relation between NIFTY Returns, Market Capitalization and Trading days.

Francis Gnanasekar I and Arul R (2014), Investment in securities that is intended for financial gain only and does not create a lasting interest in or effective management control over an enterprise. Investment in an assortment or range of securities, or other types of investment vehicles, to spread the risk of possible loss due to below expectations performance of one or a few of them.

Beenish Bashir and Shumaila Zeb (2015), the findings of the shown that in the East Asian economies investors are not good news seekers instead investors react strongly to negative information in comparison to positive news of the same magnitude. Results provided by this paper have implications for international investors. It is of immense importance for an investor to consider the holidays of the interlinked stock markets when investing in a particular market of a region as holidays not only affect the returns of the portfolios but risk as well.

Francis Gnanasekar I and Arul R (2015), Portfolio investment covers a range of securities, such as stocks and bonds, as well as other types of investment vehicles. A diversified portfolio helps spread the risk of possible loss due to the below-expectations performance of one or a few of them. They are categorized in two major parts foreign institutional investment and investments by non-

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residents.

Francis Gnanasekar I and Rajesh E (2016), calendar anomaly is a particular period that affects the stock market positively. It may produce the abnormal return for specific time. There are a number of anomalies exist in the stock market namely, Day of the week effect or weekend effect, Turn of month effect, January effect, Holiday effect and so on.

METHODOLOGY

DATA

The data collected for this empirical study are daily open, high, low and closing prices of SENSEX and NIFTY 50 indices. Instead of using closing price itself the researcher used the average of these four prices. According to Shilpa Lodha *et al.,* Majority of prior researchers have used only closing prices as if trading is done only at closing price, rather the average of these four prices can yield better results as it can control volatility up to some extent. All the data has been collected from the official website of Bombay Stock Exchange i.e., www.bseindia.com and www.nseindia.com. The sample included from 1st April 2006 to 31st March 2016, which is consist of 10 years.

Tools and Techniques used for this Study

(i) Return Calculation

The daily returns are calculated as follow;

$R_t = LN (P_t / P_{t-1})*100$

Where: $R_t =$ Return of the day 't'

LN = Natural Logarithm

Pt = closing price of the day and

P_{t-1} = closing price of the day $(_{t-1})$

(ii) Unit Root Test

The Augmented Dickey-Fuller (ADF) was used to check the stationarity of time-series data of SENSEX and NIFTY 50 indices.

(iii) Descriptive Statistics

It consists of the Average monthly Returns (Mean), Maximum, Minimum, Standard Deviation, Skewness, Kurtosis, Jarque-Bera Test and so on.

(iv) Regression Equation

For examining the Holiday effect the researcher classified the trading day into three namely pre-holiday, post-holiday and weekdays. Where pre-holiday means any trading day which has one preceding day as trading day but the succeeding day as a holiday, post-holiday means any trading day which has one preceding day as a holiday but the succeeding day as trading day and weekday means both preceding and succeeding day should be the trading day. The following regression equation used for detect holiday effect.

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Yt = α1 + α2DPoH + α3DWday + ε1.

Where the intercept or constant term (α1) is the average return for Pre-holiday and coefficients α2 and α3 denotes the average differences between the return of Post-Holiday and other weekdays. If the coefficients value of Post-Holiday and other weekdays is zero, then the return for Pre-holiday, Post-Holiday and other weekday are identical and there is no Holiday effect exists and ε1 represents the white noise error term.

DATA ANALYSIS AND INTERPRETATION

UNIT ROOT TEST

Table -1
Results of Augmented Dickey-Fuller Test for SENSEX and NIFTY 50 indices Return Series

Indices	Type	t-value	Critical Values		
			1%	5%	10%
SENSEX	Intercept	-25.20225	-3.465202	-2.876759	-2.574962
	Intercept and Trend	-25.19752	-3.961770	-3.411632	-3.127688
	None	-25.18126	-2.565901	-1.940952	-1.616613
NIFTY 50	Intercept	24.49856	-3.432811	-2.862513	-2.567333
	Intercept and Trend	-24.49381	-3.961770	-3.411632	-3.127688
	None	-24.47573	-2.565901	-1.940952	-1.616613

Source: Computed from Eviews -7

The Table 1 displays that ADF test for detecting the stationarity in the SENSEX and NIFTY 50 indices Return Series. The ADF test statistic values of Intercept, Intercept &Trend and None are less than critical values at 1 per cent, 5 per cent and 10 per cent significant level. Hence, the null hypothesis rejected i.e., there is no stationarity in the return series of SENSEX and NIFTY 50 indices. Hence, it evident that data has been stationarity in nature.

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DESCRIPTIVE STATISTICS ANALYSIS

Table -2
Holiday Wise Descriptive Statistics of SENSEX and NIFTY 50 indices

Indices	Descriptive Statistics	Pre-Holiday	Post-Holiday	Weekdays
SENSEX	Mean	**0.072**	0.064	0.003
	Maximum	6.784	13.964	6.870
	Minimum	-7.983	-8.094	-9.227
	Std. Dev.	1.260	1.631	1.204
	Skewness	-0.476	0.572	-0.482
	Kurtosis	9.159	14.748	9.915
	Jarque-Bera	905	3291	2723
	Probability	0.000	0.000	0.000
	Observations	559	567	1341
NIFTY 50	Mean	**0.062**	0.060	0.010
	Maximum	5.098	9.810	7.595
	Minimum	-8.954	-9.905	-8.912
	Std. Dev.	1.204	1.474	1.124
	Skewness	-0.964	-0.420	-0.288
	Kurtosis	10.275	11.388	9.036
	Jarque-Bera	1319	1679	2055
	Probability	0.000	0.000	0.000
	Observations	559	567	1341

Source: Computed from Eviews -7

The table -2 exposed that Holiday wise descriptive statistics of SENSEX and NIFTY 50 index. The maximum mean return occurred on pre-holiday for both indices i.e., SENSEX (**0.072) and** NIFTY 50 (**0.062**) and followed by post-holiday trading days. The lowest mean return occurred on other weekdays for both indices. It strongly evident that among the Pre-Holiday, Post-Holiday and other Weekdays trading days mean returns for all the days was different returns distributions. Therefore, the null hypothesis of the average returns of pre-holiday, post-holiday and weekdays are identical rejected. The utmost volatility found on Post-Holiday because the value of standard deviation

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maximum occurred on post-holiday. The value of Skewness returns distribution was found to be negative for all holiday wise except SENSEX post-holiday. It's documents that the holiday wise returns distribution are asymmetrical nature. The value of Kurtosis is greater than 3, it represents Leptokurtic distribution for holiday wise trading days. Moreover, Jarque-Bera test suggests that rejects the null hypothesis of return series is normally distributed at 1 per cent level of significance.

OLS DUMMY VARIABLE REGRESSION EQUATION ANALYSIS
Table -3
Estimated results of OLS Dummy variable Regression Equation

Variables	SENSEX	NIFTY 50
Pre-Holiday (C)	0.072 (1.284)	0.062 (1.187)
Post-Holiday	-0.008 (-0.097)	-0.002 (-0.023)
Weekdays	-0.069 (-1.034)	-0.052 (-0.836)
Adj.R2	-0.000207	-0.000386
F-Stat.	0.744227	0.524494
D-W Stat	1.446077	1.217641
AIC	3.403486	3.254150
SBC	3.410552	3.261216

Source: Computed from Eviews -7

The Table 3 displays that the results of OLS dummy variable regression of holiday effect in SENSEX and Nifty 50 indices. The coefficient values of Pre-Holiday positive for both indices but the post-holiday and weekdays coefficient are negatively insignificant levels. There is no holiday effect persist in this model. Moreover, Adjusted R^2 is negative and Durban-Watson Statistic is less than two, it understood that the model has serial correlation problem and spurious in nature. Hence, it is not a correct fit model for detecting the holiday effect.

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SERIAL CORRELATION TESTING

Table -4
Breusch-Godfrey LM Test

Indices	Before ARIMA		AR Terms	MA Terms	After ARIMA	
	LM-TEST	P-Value			LM-TEST	P-Value
SENSEX	221.053	0.000	1	1	1.129	0.569
NIFTY 50	453.289	0.000	1	1	0.946	0.623

Source: Computed from Eviews -7

The Table 4 shows that Breusch-Godfrey LM test for checking the serial correlation in the OLS dummy variable regression equation for holiday effect. Before adding the ARIMA terms in regression equation the value of LM-test has a high value with 0.000 p-values. It is a good sign of the existence of serial correlation in the regression equation. Hence, for removing serial correlation the researcher added the appropriate ARIMA terms in the equation as per Box-Jenkins Methodology. After inclusion of ARIMA terms, the LM-test have low value with 0.569 and 0.623 p-values. It understood that serial correlation has been removed after inclusion of ARIMA terms.

INCLUSION OF ARIMA TERMS IN OLS REGRESSION ANALYSIS
Table -5

Estimated Results OLS Dummy Variable Regression after Inclusion of ARIMA

Variables	SENSEX	NIFTY 50
Pre-Holiday	0.064 (1.179)	0.833 (0.041)
Post-Holiday	0.015 (0.241)	0.689 (0.034)
Weekdays	-0.064 (-1.017)	-0.531 (-0.029)
Adj.R2	0.092670	0.187631
F-Stat.	63.94082	143.3340
D-W Stat	1.995882	2.000157
AIC	3.306816	3.046966
SBC	3.318596	3.058747

Source: Computed from Eviews -7

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The table 5 clearly exhibits that, the inclusion of ARIMA terms in the regression equation of OLS dummy variables of holiday effect. The coefficient value of pre-holiday and Post-Holiday are positive and the Weekday coefficient is negative however none of the coefficient significant nature. The test values of the Adjusted R^2 values are positive and F-Statistic has high p-value. Moreover, The D-W statistics are nearer to the value of two. It is a good sign of no serial correlation and evident that these values are improved from the previously estimated value of OLS dummy variables regression.

TESTING OF HETEROSKEDASTICITY EFFECT

Table -6

ARCH – LM TEST for Heteroskedasticity Effect

Indices	Before GARCH			ARCH Terms	GARCH Terms	After GARCH	
	ARCH LAG	ARCH -TEST	P-Value			ARCH -TEST	P-Value
SENSEX	4	278.634	0.000	1	1	0.548	0.459
NIFTY 50	2	427.886	0.000	2	1	0.456	0.499

Source: Computed from Eviews -7

Table 6 expresses that ARCH –LM test for checking the Heteroskedasticity effect in the ARIMA model regression equation for holiday effect. ARCH-LM test has a high value with 0.000 p-values in after inclusion of ARIMA term in the regression equation. It's evident that existence of heteroskedasticity effect. Hence, in order to remove this effect the researcher used GARCH models. After applying GARCH model, the ARCH-LM test has low value with the high p-value. It understood after applying GARCH model the heteroskedasticity effect has been removed.

GARCH MODEL ANALYSIS

Table -7

Estimated Results GARCH Model in Holiday Effect

Variables	SENSEX	NIFTY 50
Pre-Holiday	0.105 (3.259)*	0.087 (2.844)*
Post-Holiday	0.006 (0.158)	0.036 (1.101)
Weekdays	-0.054 (-1.464)	-0.033 (-0.926)
Adj.R2	0.087002	0.186442

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AIC	2.813572	2.727642
SBC	2.832421	2.748847

Source: Computed from Eviews -7

Note: * denote significant at 1 per cent level

Table 4.7 clearly exhibits the estimated results of GARCH model for Holiday effect using dummy variables for SENSEX and NIFTY 50 Indices. The coefficient values of Pre-Holiday positively significant at 1 per cent level for both SENSEX and NIFTY 50 Indices. The coefficient values of Post-Holiday, Weekdays are not significant at any level. However, the coefficients values of pre-holiday and post-holiday association are positive. The test value Akaike Info Criterion (AIC) and Schwarz Criterion (SBC) decline from the previous results of ARIMA model. It is a good sign of better fit model and the coefficient value of Pre-Holiday alone significant effect in SENSEX and NIFTY 50 indices. Consequently, the GARCH model evident that Pre-Holiday trading day yields the highly significant abnormal return rather than normal trading days. Moreover, descriptive statics also apparent that Pre-Holiday gives maximum mean returns among the holiday wise trading days.

CONCLUSION

The study strongly evident the existence of Pre-Holiday effect in Indian Stock Markets through SENSEX and NIFTY 50 indices for the period of from 1st April 2006 to 31st March 2016. The researcher has applied the descriptive statistics, OLS dummy variable regression equation inclusion of ARCH and GARCH model for detecting the holiday effect. From the descriptive statistics, we found that Pre-Holiday gives a maximum mean return for both indices. The lowest mean return occurred on other trading days. The average returns of pre-holiday, post-holiday and weekdays were different returns distributions evident from this study. The serial correlation problem and Heteroskedasticity effect have been removed through appropriate ARIMA and GARCH model respectively. The empirical analysis of the GARCH model advocated that coefficient value of Pre-Holiday alone significant at 1 per cent in SENSEX and NIFTY 50 indices. As a result, Pre-Holiday yields the highly significant abnormal return rather than normal trading days. The study advised that the investors follow the pre-holiday effect and earn an abnormal return from the investment.

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References

1. http://quantpedia.com/screener/Details/83, accessed on 18th October, 2016.
2. http://thismatter.com/money/investments/market-anomalies.htm
3. *International Journal of Multidisciplinary Management Studies*, 4 (3) 76 - 83.
4. *Indian Research Journal,1 (7) 1-10.*
5. *International Journal of Marketing, Financial Services & Management Research, 3 (12) 118 – 126.*
6. Journal of Economics, Business and Management, 3 (2)*257-262.*
7. *International Journal of in Multidisciplinary and Academic Research, 4 (1) 1-16*
8. *International Journal of Research in Social Sciences,* 6 (2) 224 – 238.
9. *American International Journal of Research in Humanities, Arts and Social Sciences*, 9 (1) 33-43.
10. www.bseindia.com, accessed on 1st October, 2016.
11. www.nseindia.com, accessed on 2nd October, 2016.

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